Appendix F - Geotextile Specifications

Table F.1. Geotextile Properties for Underground Drainage: Geotextile Property Requirements[1]

Geotextile Property	Test Method	Low Survivability Woven / Nonwoven	Moderate Survivability Woven / Nonwoven
Grab Tensile Strength, min. in machine and x-machine direction	ASTM D4632	180 lbs / 115 lbs min.	250 lbs / 160 lbs min.
Grab Failure Strain, in machine and x-machine direction	ASTM D4632	<50% / >50%	<50% / >50%
Seam Breaking Strength (if seams are present)	ASTM D4632 and ASTM D4884 (adapted for grab test)	160 lbs / 100 lbs min.	220 lbs / 140 lbs min.
Puncture Resistance	ASTM D4833	67 lbs / 40 lbs min.	80 lbs / 50 lbs min.
Tear Strength, min. in machine and x-machine direction	ASTM D4533	67 lbs / 40 lbs min.	80 lbs / 50 lbs min.
Ultraviolet (UV) Radiation Stability	ASTM D4355	50% strength retained min., after 500 hrs. in weatherometer	50% strength retained min., after 500 hrs. in weatherometer

[1] All geotextile properties are minimum average roll values (i.e., the test result for any sampled roll in a lot shall meet or exceed the values shown in the table).

Table F.2. Geotextile for Underground Drainage Filtration Properties: Geotextile Property Requirements[1]

Geotextile Property	Test Method	Class A	Class B	Class C
AOS[2]	ASTM D4751	.43 mm max. (#40 sieve)	.25 mm max. (#60 sieve)	.18 mm max. (#80 sieve)
Water Permitivity	ASTM D4491	.5 sec – 1 min.	.4 sec – 1 min.	.3 sec – 1 min.

[1] All geotextile properties are minimum average roll values (i.e., the test result for any sampled roll in a lot shall meet or exceed the values shown in the table).

[2] Apparent Opening Size (measure of diameter of the pores in the geotextile)

Table F.3. Geotextile Strength Properties for Impermeable Liner Protection

Geotextile Property	Test Method	Geotextile Property Requirements[1]
Grab Tensile Strength, min. in machine and x-machine direction	ASTM D4632	250 lbs min.
Grab Failure Strain, in machine and x-machine direction	ASTM D4632	>50%
Seam Breaking Strength (if seams are present)	ASTM D4632 and ASTM D4884 (adapted for grab test)	220 lbs min.
Puncture Resistance	ASTM D4833	125 lbs min.
Tear Strength, min. in machine and x-machine direction	ASTM D4533	90 lbs min.
Ultraviolet (UV) Radiation	ASTM D4355	50% strength stability retained min., after 500 hrs. in weatherometer

[1] All geotextile properties are minimum average roll values (i.e., the test result for any sampled roll in a lot shall meet or exceed the values shown in the table).

F.1 Applications

1. For sand filter drain strip between the sand and the drain rock or gravel layers specify Geotextile Properties for Underground Drainage, moderate survivability, Class A, from Tables F.1 and F.2 in the Geotextile Specifications.

2. For sand filter matting located immediately above the impermeable liner and below the drains, the function of the geotextile is to protect the impermeable liner by acting as a cushion. The specification provided below in Table F.3 should be used to specify survivability properties for the liner protection application. Table F.2, Class C should be used for filtration properties. Only nonwoven geotextiles are appropriate for the liner protection application.

3. For an infiltration drain specify Geotextile for Underground Drainage, low survivability, Class C, from Tables F.1 and F.2 in the Geotextile Specifications.

4. For a sand bed cover a geotextile fabric is placed exposed on top of the sand layer to trap debris brought in by the storm water and to protect the sand, facilitating easy cleaning of the surface of the sand layer. However, a geotextile is not the best product for this application. A polyethylene or polypropylene geonet would be better. The geonet material should have high UV resistance (90 percent or more strength retained after 500 hours in the weatherometer, ASTM D4355), and high permittivity (ASTM D4491, 0.8 sec. -1 or more) and percent open area (CWO-22125, 10 percent or

more). Tensile strength should be on the order of 200 lbs grab (ASTM D4632) or more.

Courtesy of Tony Allen, Geotechnical Engineer-WSDOT.

Reference for Tables F.1 and F.2: Section 9-33.2 “Geotextile Properties,” 2006 Standard Specifications for Road, Bridge, and Municipal Construction.